Teneina of the United States. By V. T. Chambers, Covington, Ky.

In the July number, 1874, of this Journal, I have published a review of a paper by Prof. Frey and Mr. J. Boll, on some American *Teneina*. It was hastily, and somewhat carelessly written, it having been my intention to remodel it before offering it for publication. It was, however, published without having been read over after it was first written, and, as I had no opportunity to correct the proof, it appears full of verbal inaccuracies and misprints, most of which, however, are evidently typographical errors. Most of these were corrected in the next number of the Journal, but a few others were detected after the corrections were made. The paper also contains some personal allusions, which had, perhaps, better been omitted (as being out of place in scientific controversy, although, unfortunately, that is usually the place where they are found), and would, no doubt, have been eliminated if I had bestowed more attention upon getting the paper in proper condition for publication. How these things came about, it is not necessary to dwell upon. And, if my criticisms upon Prof. Frey's work were too severe, I can only plead the strength of the temptation in extenuation; for certainly, I have never seen an entomological paper so provocative of criticism, and so full of errors, mistakes and confusion. It betrays (or, at least, I was at first inclined to think so) unmistakable evidences of the grossest carelessness in ascertaining whether his species had not been before made known, and in identifying them so far as they were known, combined with complaints of the defective character of the work of American laborers in the same field. But, after most thorough and careful study of the Professor's papers, I am convinced that his errors and mistakes arise more from a defective knowledge of the English language, than from carelessness. And now, after another careful study of the Professor's paper, I wish to offer the following remarks on some of his species. Many of the Professor's errors, I am satisfied, could not have been committed had he given to the papers of Dr. Clemens, and the writer the same, amount of careful study, with a competent knowledge of the English language that I have given to his pamphlet.

Gracilaria superbifrontella—(Clem.)

This species, is no doubt, rightly identified by Prof. Frey; but, almost certainly, Mr. Boll gave him incorrect information as to the food-plant of the larva. Mr. B. thought the larva fed on oak leaves,

which is almost certainly an error, if the species is *superbifrontella*. Dr. Clemens bred it from the witch-hazel (*Hamamelis Virginiea*), and it has never been (so far as I have been able to ascertain), bred from any thing else in this country; and, it is exceedingly improbable, that a species of this genus feeds on two plants so remote from each other as the hamamelis and oak. Prof. Frey gives an account of the way in which the mined leaves, gathered by Mr. Boll, were jumbled together, and, no doubt, the error arose in this way. Besides, it frequently happened, that the Professor was unable to tell which of three or four kinds of leaves his species came from (as in the case of his *G. elegantella*, and other species), and in, at least, one instance, *Lithocolletis gemmea*, where the food plant is given as if it were known. I shall show, presently, that he was mistaken, in all probability.

G. elegantella—(Frey).

I have already *loc. cit.* stated that this is a synonym for *G. packardella*, Cham. Prof. Frey, says that it may be from American oaks, or it may be from the maple (*Aer. sacchainum*). I have long known the larva on the maple, and last fall succeeded in breeding *G. packardella* from it. The mine is linear and short, and the larva soon leaves it to feed on the under side of the leaf, curled down so as to make almost an elongate cone, with a diameter a little greater in one direction than in the other, and truncate near the top.

G. mirabilis—(Frey).

This is certainly *Parectopa robiniella*, Clem., which I had already referred to *Gracilaria*. Had Prof. Frey, with an adequate knowledge of English, examined carefully Dr. Clemens' description of *P. robiniella* he could not have failed to recognize it. In the paper in the last July number, before referred to, I did not recognize *P. robiniella* in Prof. Frey's account of *mirabilis*. I have now no doubt whatever of their identity. Professor Frey had given *Parectopa robiniella* (?) Clem., as a synonym for *Lithocolletis gemmea*, Frey, and being misled thereby and not fully understanding Prof. Frey's description of *L. gemmea*, I believed them to be the same, and so treated them in my review of Prof. Frey's paper. Now after more careful study, I am prepared to say that in *L. mirabilis*, Prof. Frey has given a good description of *P. robiniella*, and that an insect which meets the requirements of his *L. gemmea*, can not be *P. robiniella*, Clem., nor anything like it. I have been unable to recognize any Teneid known to me in *L. gemmea*,

which is no doubt a new species. But Prof. Frey is, I am satisfied, in error when he says that it is a leaf-miner of the locust. Four insects are known to mine locust leaves in this country. They are *Lithocolletis robiniella*, Clem., *L. ornatella*, Cham., *Parectopa robiniella.*, Clem., and the beetle *Hispa Suturalis*, Say. They are all abundant wherever I have sought for them, and in this locality they are seriously damaging the locust trees. Owing to their ravages (mainly however, to the beetle which feeds on the leaves, both in the condition of larva and imago), locust groves by midsummer, look parched and dry as if a fire had swept over them. Only the three above mentioned lepidopterous mines are known on these trees. So Prof. Frey found only the same three in his leaves; and he bred *L. ornatella* and *L. robiniella*, from two of them. Why should he not have bred the third, *P. robiniella*? he did no doubt, and he has described it well as *G. mirabilis*, but not at all in his account of *L. gemmea*. He thus describes the three mines which he found in locust leaves: "A common *Lithocolletis* dwelling, with smooth border in which the larva is transformed," and in which we recognize the mine of *L. robiniella*, Clem.; also "an upper and under side mine of rounded not much serrated shape" and which is certainly that of *L. ornatella*; and also a "digitated upper side mine," which, omitting color, is as acurate a description of the mine of *P. robiniella*, as could be given. Now, as there is no doubt about any of these mines nor in this country, as to the insects which make them; and no other locust leaf miners have ever been heard of; as Prof. Frey had *L. robiniella*; and its mine; and *L. ornatella* and its mine; and had the mine of *P. robiniella*; and as *G. mirabilis* is a good description of *P. robiniella*, an *L. gemmea* is no description of it at all; then considering the mixed nature of the collection of leaves, it is a safe conclusion that *L. gemmea*, was not bred from mines in locust leaves. I proceed to show wherein *L. gemmea*, Frey, differs from *P. robiniella*, Clem. The tuft of the vertex in *L. gemmea*, is said, by Prof. Frey, to be more developed than in *L. ornatella*; in *P. robiniella*, in perfectly fresh specimens, it is as smooth as in a *Phyllocnistis*. In older specimens and those which have got their scales rumpled more or less, the scales of the vertex become roughened so that Dr. Clemens, described it as tufted. In *L. gemmea* "the forewings are bright saffron" but (compared with *ornatella*), "the darkening at the base is wanting;" in *P. robiniella*, the wings are dark brown, *P. robiniella* has no massing of gold scales on the fold, nor any "pale golden band straight and inwardly dark margined near the basal third of the wing," nor any band at all except the costal streaks crossing the apical part of the wing as in *G. mirabilis*. In short the description of *L. gemmea*, does not correspond

with that of *P. robiniella*, in more than one or two particulars, *e. g.*, the white tips of the antennæ, in which it resembles *G. mirabilis*. If Prof. Frey had understood Dr. Clemens' clear, and acurate description of *P. robiniella*, he never could have made the mistake of confounding it with *L. gemmea*, even doubtfully, and had I not been misled by that identification, I should have detected the difference much sooner. Prof. Frey was probably led into the mistake, not by the resemblance of the insects, but by the supposed fact that *L. gemmea*, came from locust leaves from which he already had *L. robiniella*, and *L. ornatella* and the only other lepidopterous mine known was "the digitate mine of the upper surface," which is inhabited as is well known by the larva of *P. robiniella*. Some specimens of *L. ornatella*, are much less dark at the base of the wing than others, some are brighter, some darker golden, and sometimes the second fascia is found slightly interupted in the middle; but of the hundreds that I have seen, none had the tips of the antennæ white, and but for this I should consider *L. gemmea* as being much nearer to *L. ornatella* than to *P. robiniella*. *P. robiniella* is decidedly larger than *L. ornatella*. In addition to the reasons that I have elsewhere given for placing *P. robiniella* in *Gracilaria* is the position of the insect in repose.

Lithocolletis quercitorum—(Frey).

In the former paper I referred this to *L. Fitchella*, Clem. There seem minute differences between *Fitchella* and *quercitorum* as described by Frey. If not the same, they are very nearly so; an inspection of authentic specimens of each would determine. Besides *Fitchella* there is no other known American species which has the large dorsal white spot on the forewings as described in *quercitorum*.

L. longestriata—(Frey).

Identified doubtfully by Frey with *L. argentifimbriella* is no doubt that species. Dr. Clemens states that the antennæ are anulate with dark fuscus, but the annulations are very indistinct in all my specimens. Neither Dr. Clemens, nor Prof. Frey, mention that the apical joint of the antennæ is fuscus, but it is so.

L. alinella (?)—(Frey).

Prof. Frey, supposes that it came from alder leaves, because it so nearly resembles the European species. But that is by no means a necessary conclusion. No alder leaf miner has yet been found in this country. But that does not prove that none exist.

L. intermedia—(Frey).

Is very near *L. celtisella*, Cham., if I rightly understand Frey's description. It may be the same, but I think it is not. If Prof. Frey, is correct in the belief that it mines oak leaves, then it is new, as no oak leaf *Lithocolletis* of that group is known in this country.

L. consimilella—(Frey).

In the former paper, I suggested that this might prove to be identical with *L. tritæniaella*, Cham., which is the only American species hitherto known in this country, which has the fascia on the forewings, all internally dark-margined; but the markings behind the third fascia seem to be different from *tritæniaella*.

L. scudderella—(Frey).

This is certainly a redescription of *L. solicifoliella*, Clem. & Cham., though I did not recognize it at the time the former paper was prepared. I have discussed it more fully in a paper now in the hands of the editor of the *Canadian Entomologist*.

L. ignota—(Frey)

Or rather the form which Frey describes as the male (?) of it under the name of *L. Bostonica* is I think *L. hilianthivorella*, Cham., though the ground color of the wings in *hilianthivorella* is rather darker than I understand it to be in *Bostonica*. Only an examination of authentic specimens can determine it accurately. *Hilianthivorella* is very near *L. ambrosiærella*, Cham., and is perhaps properly considered only as a variety of it.

Jupiter sometimes nods. Considering the rank of Prof. Frey in Europe, as a Lepidopterist, it might look presumptious in me to characterise his work as I have done; but it so happens that he has been dealing in a manner altogether unworthy of his reputation, with a few species with which I am especially familiar. And when an authority like Prof. Frey, does bad work it only calls for severer criticism.

Cosmoptery.

I have sometimes thought that European Micro-lepidopterists generally, allow scarcely "ample room and verge enough" for variation

within the limits of species, and that some of their species are perhaps only varieties. Usually, when specimens are bred from different food plants, or where there are small differences of larval habits, a mark or two, more or less, in the imago is usually considered sufficient to found a new species upon. Examples of this may be found in most of the little leaf-mining genera as *Nepticula*, *Lithocolletis*, *Phyllocnistis Tischeria* and in *Butalis* and others. This impression has been made upon me not by inspection of specimens of European species (for the number of these that I have seen is not great) but by a study of the writings of European Micro-lepidopterists. Therefore I may be wrong, and an inspection of specimens of some species, the validity of which I have been inclined to doubt, might convince me that my doubts were unreasonable. Following what I conceive to be the example of these Micro-lepidopterists, I have sometimes described as distinct species, insects as to which great doubt existed in my own mind whether they should be so treated Some of our species of *Lithocolletis*, *Phyllocnistis*, *Aspidisca*, *Butalis* and others, I regard as only doubtfully entitled to specific value, though I doubt not they would be regarded as distinct by most Micro-lepidopterists of Europe, because certainly 'species' do pass current there which are no more distinctly separate than those as to which I entertain doubts as above stated. Some American species which have been described in Europe as distinct, I am fully satisfied are not so. And as to the species mentioned and described below I certainly entertain doubts. If *Cosmopteryx orichalcea* is distinct from *C. hierochloœ*, and *C. Clemensella* from *C. gemmiferella*, then the species here described as *C. pulchrimella* is entitled to specific rank. But Dr. Clemens did not consider *clemensella* and *gemmiferella* distinct when he sent them to Mr. Stainton; and as to *orichalcea* and *hierochloœ* Mr. Stainton writes: "specimens of *C. orichalcea* do occur with the apical streak interrupted, and when that is the case I am quite unable to point out how the insect can be distinguished from *C. hierochloœ*" (*St. ed. Clem.* p. 100, and *Nat. His. Tin*, v. 12, p. 24.) I submit that the difference thus indicated is not of specific value even if it were constant.

However, it is the old question what constitutes a species, as to which every naturalist has his own 'notions'; about which *non est disputandum*. For myself, I am much inclined to consider *orichalcea* and *hierochloœ* as synonyms; and *gemmiferella*, *Clemensella*, and the insect described below, as belonging to the same species.

C. pulchrimella, n. sp. (?).

Rich dark brown, with a faint greenish tinge, not discernible in all lights. (Dr. Clemens says that *gemmiferella* is 'dark greenish-brown,"

and Mr. Stainton says, of *Clemensella*, that it is darker than *gemmiferella*. Something—much, no doubt, in such matters—is to be allowed for "the personal equation.") Substituting "rich dark brown with a faint greenish tinge," for "dark greenish-brown," the following portion of Dr. Clemens description, is applicable to this insect: "labial palpi, dark greenish brown, with a silvery stripe on the front of the third joint, and another behind, continued to the second joint; face, head and thorax, dark greenish-brown, with a narrow central silvery line continued to the thorax, and one of the same here above the eyes on each side." In this species, however, the white lines on the palpi extend the entire length of both joints, and the white line is not found on the face, and is but very indistinct, if it exist at all, on the vertex. Dr. Clemens further says, that "the antennæ are dark greenish-brown, with two silvery lines on the basal joint, the stalk annulate with silvery rings, and a broad silvery ring before the tip, which is likewise silvery." In this species, I have not been able to detect any annulations on the antennæ, though each joint of the basal half has a white line beneath, and instead of the "broad silvery ring before the apex, which is likewise silvery," there are three silvery annulations beyond the middle, the first two of which are closer together than they are to the third, and there are two others before the tip, which is of the general hue, and not silvery. As Mr. Stainton points out no difference between *gemmiferella* and *Clemensella*, other than those of the forewings, the presumption is that it does not differ otherwise. Dr. Clemens' description proceeds: "Forewings, dark greenish-brown to the middle, and from the apical third, to the tip, with an orange colored patch, rather beyond the middle of the wing, extended across the wing, and a little produced along the costa behind, having a large, transverse oval smooth patch of elevated silvery scales; somewhat violet-hued on the internal margin, the patch extending nearly across the wings; another, smaller and similar, nearly round one behind it on the inner margin, and another small one on the costa, behind the produced portion, with a white costal streak above it in the cilia. All these patches are somewhat black margined. Near the base of the wing are three short silvery streaks, one nearly on the disc, one near the fold beneath it, and an oblique one above it near the costa. The cilia of the extreme apex is silvery white, black margined above, with a violet silvery scale in the middle of the wing before the tip. The inner margin, at the base of the wings, is silvery." Mr. Stainton (*loc. cit.*, *page* 25 *in note*) corrects his description, as follows: "Anterior wings dark greenish-brown, with three short longitudinal silvery streaks *near the base*, with a *reddish*-orange fascia, edged with silvery

violet in the middle (*this fascia is considerably broadest on the costa, its hinder margin being formed by two silvery violet spots, which are by no means opposite*); at the apex is a short silvery white scale, preceded by a violet silvery spot, *with which it is not connected.*" And of *Clemensella*, Mr. Stainton writes: "The ground color of the anterior wing is darker, (than in *gemmiferella*), the orange fascia is paler, not so reddish, its margins are pale golden, instead of silvery violet, and its hind margin is almost straight, and thus, very different from *gemmiferella;* finally, the apical streak is continuous, not interupted, and of a silvery white throughout." In the specimen before me (*pulchrimella*), the thorax and forewings are rich dark-brown, tinged with green; the silvery white streak on the thorax is interupted, and, as in Dr. Clemens' description, it extends on to the base of the forewings; at about the basal fourth of the wing length, are the three silvery streaks showing a violaceous hue in some lights, the one nearest the costa begining a little before the others and oblique, and there is another minute one on the extreme base of the costa; at the middle of the wing length is the silvery fascia, which does not quite touch the extreme costa, though the intervening space is almost inappreciable. In some lights, this fascia looks like burnished steel, in others it exhibits pale golden reflections; its margins are straight and parallel, anteriorly it has a narrow margin of dark scales, from the dorsal margin to beyond the middle; posteriorly, the the costal portion, only, is dark margined; at about the apical fourth of the wing length, is an oblique fascia of the same hue, with the first mentioned fascia nearest the base on the dorsal margin, and extending to a white spot in the beginning of the costal cilia, and very narrowly margined before by dark brown scales. In the space between these two fascia, Mr. Stainton and Dr. Clemens locate their 'orange,' or 'reddish-orange' fascia. But, if by 'orange,' or 'reddish-orange,' is meant anything like the orange, reddish-orange or golden fascia of *C. Schmidiella*, *Orichalcea* and *Lienegiella*, as figured in *Nat. His. Tin.*, *vol.* 12, then *pulcherimella* is something quite distinct; for, on first observation, the difference between the color of this part of the wing, and that before the first fascia, is not likely to be observed; on closer observation, however, it will be seen that there is a paler hue, what might be called an orange-brown, or, in some lights, bronzed, extending entirely across the wing adjacent to the first fascia, but narrowing backwards almost to a point on the costa at the second fascia, but much more distinct towards the costa. In some lights, the whole space between the two fascia, shows the orange-brown hue, but, in such lights, the wing before the fascia exhibits nearly the same hue. There are, also, four

or five minute, violet, silver specks in the space between the fascia. Behind the oblique fascia, the wing is darker brown, with an oblong, violet, silver spot at the base of the dorsal cilia, and another at the apex, passing into the snow-white apical cilia. The cilia are, otherwise, dark brown. The under surface of the thorax and abdomen, and the basal joints of the anterior legs, are silvery or pale golden, or like burnished steel, according to the light. Anterior tibiæ and tarsi, dark brown before, silvery white behind; posterior and middle legs, dark brown, with the tibiæ and tarsi annulate with silvery white, and a silvery white streak on the posterior tibiæ behind. *Als. ex.* scant, 4 lines. Taken at Covington, Ky., May 22, in a season, at least, two weeks later than usual.

It is the only specimen of the genus that I have taken in six years of active collecting.

Glyphipteryx.

Of this genus as of *Cosmopteryx* six years of diligent collecting has yielded but a single specimen of a single species and it was taken at the same time and place with the *Cosmopteryx* (*supra*) viz.: Linden Grove Cemetery, where more than nine-tenths of my Kentucky Micros have been taken, and at a time when I had given up all hope of finding there anything new. At the same time and place I found a new species of *Gracilaria*. Whilst this locality produces an abundance of species of most genera, a few genera seem almost unrepresented. As for instance I have taken here but a single specimen of *Anaphora*, whilst near Mammoth Cave I find several species, and took more specimens of that genus than of all others put together during the two weeks in July that I spent there.

G. exoptatella, n. sp.

This insect was taken at the same time and place with the above described *Cosmopteryx* and like it is the only specimen of the genus that I have met with here, and therefore comes like one born out of due time and none the less welcome. It is so near *impigritella*, Clem., that before I gave it a close examination I took it to be a specimen of that species. But Dr. Clemens says that the first (the large curved silvery dorsal streak is dark margined on both sides in *impigritella*, whilst in this specimen its margins are no darker than all of the basal portion of the wing, except close to its apex, from which they pass backwards along the middle of the wing for a short distance, but in some lights they are not

visible at all. The form and position of this streak are almost exactly as in *Haworthana* but it is more slender and pointed. In *impigritella* the forewings are said to be dark bronzy brown slightly touched with golden brown between the costal streaks; in this specimen the basal part of the wing and the thorax and head are dull leaden brown, with faint bronzy reflections in some lights, and passing about the middle into golden brown which covers the apical half of the wing though in some lights portions of it appear dark brown. There are five costal streaks placed as in *impigritella* and *equitella* 2, 1, 2 and (as in *impigritella*) all these streaks are decidedly dark margined internally; but these dark margins do not extend across the wing as in *impigritella*, nor do the dark margins of the first and second streaks meet; the extreme costal margin is dark brown from the base to the tip, except where it is interupted by the costal streaks. Dr. Clemens says that the 'costal and dorsal streaks in *impigritella* are silvery white, and that the violet-silvery' spots are absent. In this insect the costal streaks are all white but are tipped with violaceous metallic scales, and the second and third are especially so; the first is oblique decidedly, the second less so, and the others are perpendicular to the margin; opposite the points of the first and second costal streaks is a dorsal white streak placed as in *impigritella*, but ending in a violet metallic spot; the second costal streak—metallic violet, as in *equitella*—points towards but does not quite attain a violet metallic spot within the dorsal margin, which is not mentioned in the account of *impigritella*, but which in *Haworthana* is represented by the *second* of the *metallic* spots; and in *equitella* by the first one that is the longitudinal or oblique dash, (not by the spots which in those species the second costal streak nearly or quite touches,) it is immediately opposite the third costal streak; with careful manipulation there may be observed a minute violet metallic point opposite to the fourth costal streak and just within the dorsal margin; the last dorsal and last costal streaks are opposite and both are white tipped with violet metallic scales and are slightly curved and almost meet so as to form a fascia concave towards the apex. The apical patch is velvety dark brown, the cilia of the dorsal margin and apex are greyish silvery with a wide fuscus band covering their base. Unfortunately though the insect is perfect in every other respect, the costal cilia are injured so that I can not tell whether the costal ciliary dark line of the other species is present or not. The palpi are white with a dark brown line beneath as in *Haworthana* Antennæ dark brown, legs and tarsi dark brown, the tarsi annulate with white, and the middle pair yellowish within; venter silvery white, the anal tuft a little tinged with yellow. *Al. ex.* $\frac{3}{8}$ inch. Kentucky.

As with the *Cosmopteryx*, I hardly know whether this insect represents a new species, or is only a variety of some described one. The ornamentation is almost equally like *Haworthana*, *equitella* and *impigritella*.

LITHOCOLLETIS—*L. Rileyella*, n. sp.

This is the nearest and only near ally of *L. argintinotella*, Clem., yet made known in this country. It is indeed exceedingly close to it, but it is darker saffron, has six instead of five costal streaks, which are (as are also the four dorsal streaks) all dark margined internally and are all very distinct, whilst in *argintinotella*, the fourth and fifth are small and sometimes obsolete, and the antennæ instead of being silvery white, are dark ocherous, with brown annulations. As in *argintinotella* the face and palpi are white, the vetex yellowish and white, and the thorax and forewings are golden saffron. On each side of the thorax just above the patagia, is a snow-white line continuous with the rather wide and distinct snow-white median basal streak of the forewings; which extends beyond the basal fourth and is unmargined. The first costal streak is very oblique opposite the basal position of the first dorsal streak, and is continued very distinctly along the costa to the base, and after it leaves the costa is very faintly, dark margined above. The second costal is less oblique, the third is still less so, the fourth is a hook almost (or quite?); meeting the apex of the third dorsal, the fifth is a short line pointing obliquely forward, and the sixth is a small spot close to the apex, and just beyond the minute black circular apical spot; the first dorsal streak is like that of *argintinotella*, but is somewhat wider; it is placed about the basal third, is wide upon the costa curving back along the middle of the wing to a point near the apical third, and like all the other costal and dorsal streaks, it is strongly dark margined, internally its dark margin produced backwards along the middle of the wing till it joins the dark margin of the second dorsal streak, which is distinct triangular with its dark margin produced beyond it; the first dorsal streak recalls the similar streak in *Glyphipteryx exoptatella* and *G. Haworthana*, but is wider on the base. The third dorsal as above stated is opposite to, and almost confluent with the fourth costal streak; the fourth dorsal is small and opposite to the minute apical spot: cilia yellowish with a brownish wider marginal line on the base. Abdomen and tuft yellow: hind legs yellowish silvery with the outer surface of the tarsi dark brown. Described from two specimens, received from Prof. Riley and Miss Murtfeldt, from St. Louis, one captured, the other, labeled "tentiform mine on under surface of red oak leaves," *al. ex.* of one, $\frac{1}{4}$ inch, the other $\frac{1}{3}$ inch.

LAVERNA—*L. Murtfeldtella*, n. sp.

A single captured specimen received by me, from Prof. Riley and Miss Murtfeldt, in perfect condition, seems nearer to *L. propinquella* than any other species known to me, but the resemblance is not very close. Form of palpi nearly as in *L. ochracella*, Ins. Brit., Vol. 3. It has the head and palpi silvery white, the second palpial joint brown on the outer surface, and the third dusted with brown beneath, the antennæ are dark brown. Anterior wings brown, faintly streaked or marbled with ocherous. There is an oval white spot on the base of the dorsal margin, running lengthwise along the margin, but wide enough to reach the fold; a little further back is a white dorsal spot partly grizzled by brown scales, and connected with the first spot by a faint ocherous line along the fold, the wing between these white spots and the costal margin is brown faintly streaked with ocherous, and from the second spot to the costa, in some lights, is indistinctly suffused with grayish; just behind the middle of the wing is a nearly semi-circular ocherous line convex towards the dorsal margin, the hinder part of this line or narrow band is more distinct than the anterior portion and contains or rather is interupted by a short white longitudinal dash, placed near the end of the cilia; a little further back is an irregular ocherous spot, containing a short longitudinal brown dash, followed by a white one, or by some white scales, the space between the black dash and the first white one is brown: in some lights, suffused with hoary, and on the extreme costa just before the cilia is a small hoary spot indistinctly connected with the whitish scales behind the black dash; behind this the wing is brown with three minute white costal streaks in the cilia and one longer slightly oblique apical one, all of which are only visible in certain directions; costal and apical cilia brown, dorsal cilia silvery gray. The thorax is white with a pale purplish fuscus spot in front, the legs are silvery yellowish behind, and brown in front annulate with white. Abdomen brown above, silvery beneath with the tuft yellowish silvery.

GELECHIA—*G. Discoocella*—CHAM.

From an examination of a single specimen given to me by Prof. Riley and Miss Murtfeldt, I find that the two specimens, from which the description was prepared, are a little worn. In the perfect specimen, the so-called ocherous streaks within the inner margin are not present, except in the fold; the discal brown spot not so easily dis-

tinguishable from the surrounding hue; and the ochreous spots around the apex are each margined behind with blackish, or more properly, there are a series of minute black spots margined before with ocherous scales; the thorax, though paler than the wings, is rather brown, tinged with ocherous, than simply ocherous; the antennæ are rather robust, and somewhat serrated toward the apex. In this specimen, the central brown dot in the spot at the end of the cell, is connected with the surrounding brown, not an 'island' as in my two specimens. Nevertheless, I have no doubt, it is the same species. The *al. ex.* is $\frac{9}{16}$ths inch, whilst, in my specimens, it is $\frac{1}{16}$th inch more, This specimen, is labeled, by Miss Murtfeldt, "Leaf folder of a small weed." A perfectly fresh glossy specimen is one of our prettiest species of the genus.

G. physalivorella, n. sp.

A very different thing from *G. physaliella*, Cham., though labeled, by Miss Murtfeldt, "from physalis." It rather resembles, in ornamentation, *G. ambrosiœlla*, Cham., though the ornamentation of the wings is, perhaps, even more like that of *Tischeria heliopsisella*, though sufficiently distinct from it, also. *Second joint of the palpi with spreading scales, almost brushlike, and not twice as long as the third.* The forewings are ocherous, mottled with brown spots, connected with each other by longitudinal and oblique brown streaks; in the costal half of the wing, and running nearly parallel to the costa are three black lines, in a line with each other, but not connected; the first and shortest is before the middle, the second and longest begins about the middle, and the third is before the apex; cilia of both wings ocherous-gray, hindwing of a leaden ocherous hue. Abdomen yellow, the anal tuft suffused with pale-reddish; head and thorax, dark shining-brown; antennæ brown, faintly annulate with ocherous, with the extreme tip ocherous, and six distinct ocherous annulations before the tip; second joint of palpi, ocherous and brown, mixed, third joint brown, with extreme tip, and an annulous before the middle, ocherous. *Al. ex.* $\frac{1}{2}$ inch. From Prof. Riley and Miss Murtfeldt, from Missouri.

G. simpliciella, n. sp.

Pale grayish, slightly tinged with ocherous. There is a small blackish discal spot about the middle of the wing, with four or five very small and indistinct ones before it, and two or three nearly in a line behind it. *Second joint of the palpi but little thickened toward the*

apex; third pointed, about half as long as second. *Al. ex.* little over $\frac{1}{2}$ inch, Kentucky. Has some resemblance to a worn specimen of *G. Solaniella*, but it is quite distinct and more decidedly gray.

G. inæquepulvella, n. sp. (?)

I am not certain that this of which I have received a single slightly worn specimen from Miss Murtfeldt, should be described as a distinct species, I think, however, that it is distinct. The wings are much paler than in *Solaniella* though this may be in part due to the fact that they are a little rubbed, but there is in *Solaniella* to which this approaches most closely no appreciable difference in color between the general surface of the primaries and the cilia, except that the latter are darker, the ocherous color being absent though the white cilia are present. On the contrary in this species the cilia are sordid very pale yellowish with two faint brown hinder marginal lines near their apex and in this species the head and palpi are creamy white. *Al. ex.* three-eighths inch. Hab. Missouri. *G. parvipulvella*, Cham., from Texas is also very near this species but is but little dusted.

G. Marmorella, n. sp.

Palpi slender, third joint as long as second; pale gray marbled irregularly with dark brown, with no salient markings. *Al. ex.* three-eighths inch. Difficult to distinguish from *G. discomaculella* even on comparison of specimens. But *discomaculella* has a tolerably distinct though pale fascia just before the cilia, and also before the fascia a large costal and opposite dorsal patch which almost meet behind the middle of the wing. Hab. Kentucky.

G. ambrosiæella, n. sp.

Palpi scarcely attaining the vertex. Second joint brush-like; third joint thickened and about half as long as the second. It is white suffused over the greater portion of the body and wings with ocherous yellow, and the fore wings marbled with dark brown streaks and spots which are confluent, and especially noticeable about the middle of the costal half of the wing. The antennæ have the basal three-fourths ocherous annulate with brown; the apical fourth has five series of joints each having the first joints black and the third one white, but at the apex the penultimate joint is black and the terminal one white. The palpi are ocherous faintly sprinkled with brown and the third joint has a

brown annulus at the base and another about the middle. Vertex, thorax and forewings whitish suffused with ocherous, the forewings marbled as above stated and with an irregular brown spot in the apical part, the basal and dorsal portions however are but little marked with brown: under surface of body, and the legs, pale ocherous, the first pair of legs being distinctly marked with dark brown on the basal joints and but faintly so on the others, except the tarsi which are annulate with dark brown; the intermediate and posterior legs are but faintly marked with dark brown. *Al. ex.* $\frac{7}{16}$ inch. Kentucky.

The larva feeds in September and October inside of the seed capsules of the 'hog weed' (*Ambrosia trifida*). It, while small, severs the capsule at its base, and eats into it at that point. I have also bred from the same gathering a beautiful little moth, belonging to the *Tortricidæ*, and I am not certain that I have seen the *Gelechia* larva when it was very young, as I am inclined to refer all of the very small larvæ to the *Tortrix*. The smallest *Gelechia* larvæ were already more than one-fourth grown; they are then pale green with the head and shield a little darker green; the next two segments have each a transverse row of six greenish fuscus spots on top and another spot on each side. The remaining segments have each two spots on each side, and on top are two transverse lines or bands of the same greenish fuscus hue, the hinder band scalloped near each end, both before and behind. But it is probable that the color and arrangement of the marks varies with each moult, as the larva in its last stage has the head pale fungineous with the other segments, yellowish white, and the transverse bands and spots almost obsolete, and very pale dusky green, while two longitudinal pale reddish lines extend along the back on, all the segments except the head. In the breeding jar the larva leaves the capsule to pupate, and passes the pupa state among the decaying bracts and small leaves; but frequently like the larvæ of *G. Hermanella*, and some other species it eats its way into the pith of corn stalks or into pieces of cork or other soft substances, and mixes the comminuted particles with its cocoon.

On page 222, *vol.* 6, of the Canadian Entomologist, Miss Murtfeldt has mentioned an undescribed species as *G. chambersella* and has obligingly favored me with a specimen. It is quite distinct from *G. ambrosiœella* though allied to it, and though feeding on a species of *Ambrosia* it feeds on the leaves and not on the seed. *G. ambrosiœella* is more distinctly marked then Miss Murtfeldt's species, and the wings are clouded with fuscus spots and patches. Some specimens emerge in October and November, some pass the winter the pupa and some in the larva states.

There is also a coleopterous larva which feeds on the seeds of *A. trifida* eating a large hole in the sides of the capsule. I have not yet succeeded in rearing it.

G. cristatella, n. sp.

Palpi over arching the vertex with the second joint elavate, the scales at its apex somewhat spreading; third joint almost acicular more than half as long as the second, second joint of the palpi brown dusted with white, and white along the upper surface; third joint white with a brown annulus before the middle and another before the tip; tongue and a narrow stripe above it, extending along the inner margin of the eyes dark brown; head white; thorax dark brown sprinkled with white along the margins, the anterior margins entirely white, and with a small raised tuft just before the apex. Antennae annulate with white and dark brown, forewings at the base dark brown mixed with white and with a distinct tuft on the fold margining the dark brown basal portion behind; then follows an oblique white costal streak crossing the fold and interrupted on the fold; behind this another dark brown band crosses the middle of the wing, margined behind by two raised tufts, one of which is above; and the other beneath the fold, and followed by a transverse band of mixed white and brown, which is margined in part behind, by a brown tuft within the dorsal margin nearly opposite the begining of the cilia, behind which the apical part of the wing is brown sprinkled with white, except a short slightly curved dorsal white streak at the begining of the cilia, and a similar larger opposite costal streak. The legs are marked alternately with white and brown or grayish brown spots and bands; the under surface of the thorax is white dusted with brown, the white of the thorax and legs having a metallic hue. Its external appearance is that of a *Laverna*, but the wings are those of a *Gelechia*. Except that the second joint of the palpi is simple, it resembles the species which I have placed in *Adrasteia*. But those species shade into *Gelechia* so that I am now satisfied that *Adrasteia*, can not be mentioned as a distinct genus. *Al. ex.* $\frac{1}{2}$ inch, Kentucky. A very pretty species.

HYALE—*gen. nov.*

Head depressed clothed with appressed scales, vertex wider than long; face strongly retreating; eyes moderate; antennæ slender about half as long as the wings distinctly ciliated; basal joint small; tongue rather short, scaled; no visible maxillary palpi; labial palpi

recurved, divergent, over arching the vertex, simple; the third joint more than half as long as the second, and accuminate similar to those of many species of *Gelechia*. Wings broad; with rather short short ciliæ. The forewings in outline and neuration nearly those of *Strobisia iridipenella*, Clem., widest about the middle and with the apex obtusely rounded; the costal vein runs near the subcostal for about half its length and then rather suddenly diverges, attaining the margin about the middle; the subcostal subdivides into five nearly equidistant branches of which the first arises before the middle and the last attains the apex; the median subdivides about the end of the cell into three equi-distant branches of which the first arises opposite to the third subcostal branch, and the last is parallel to the apical branch of the subcostal, and is produced forward for a short distance into the cell which is closed; there is no discal branch; fold very distinct, sub median vein furcate at its base. Hind wings wider than the forewings, width equal to half of their length, in form and neuration like those of *Tortrix*; the costal margin is slightly excised from the base to the apical fourth, and the dorsal margin is *very faintly* excised beneath the rounded tip. The costal vein is long, the cell is closed, short and wide, and near the subcostal vein the discal is strongly angulated towards the base. The subcostal and median are both furcate behind the cell, the superior branch of the subcostal going to the apex; the median emits a branch before the end of the cell; the fold, submedian and internal veins are all distinct. (Perhaps it would be more correct to say that the median is straight and with out branches, and that the discal is strongly angulated anteriorly near to the subcostal vein and still more angulated posteriorly near the median with a branch from the latter angle which bifurcates behind the cell). The wings are but slightly deflexed in repose, and the insect sits flat upon the surface of the object on which it rests.

H. coryliella, n. sp.

Shining black with a velvety lustre; the base and under surface of the palpi, face, anterior surface of the basal joints of the legs, and under surface of the abdomen are white; there is a transverse white spot on the discal vein of the forewings which is visible also on the under surface; sometimes it is faint and interrupted; and there is a white streak across the middle of the apical ciliæ, and sometimes the entire apical half of the cilia is white. Antennæ fuscus, hind wings shining fuscus. *Al. ex.* $\frac{3}{8}$ inch.

The larva is white and feeds on the under surface of leaves of the filbert (*Corylus Americana*), under a thin silken web which is rather

large and is placed in the angle of the midrib, and a lateral vein. The web is so thin that larva is visible through it; and yet is so compact, that I at first mistook it for the loosened epidermis, and believed it to be a mine. When the larva is ready to pupate, it gathers the whole web into a dense mass around it, in the angle of the veins, and passes the pupa state under it. I have only found it in September and October, and the moth emerges in April.

Semele—gen. nor.

This genus is allied, but not very closely, to *Tinea*. In repose the species sit very flat upon the surface on which it rests, with the wings nearly horizontal but a little depressed. The tongue is rather short and is naked. Maxillary palpi well developed, pendant; labial palpi divergent, ascending as high as the vertex, with the second joint a little longer and not much thicker than the third, and clothed with scattered *depressed* bristles; head roughened as in *Tinea* nearly; Antennæ slender simple about $\frac{2}{3}$ as long as the forewings. Wings long rather narrow (having but a single specimen I have not denuded them), the cell of the forewings is closed and they are numerous marginal veins; the cell of the hind wings *appears* to be unclosed and they have long ciliæ and are narrow, with the costal margin excised from about the middle and the posterior margin curved like a knife blade.

S. cristatella, n. sp.

Maxillary palpi yellowish white; labial palpi with the second joint dark brown with a white line along its upper surface; third joint white. Face white, vertex black, antennæ brown, and the upper surface of the thorax deep velvety black. Fourwings shining velvety black with a large spot like burnished silver at the base and not quite touching the costa, margined behind by a transverse row of raised scales; about the basal fourth is a shining silvery fascia which is slightly curved, a little irregular in outline, widest about the middle but wider on the costal than on the dorsal margin, and margined behind by a transverse row of raised scales. About the middle of the wing is another fascia of the same hue, which is a little oblique, being nearer the base on the costal than on the dorsal margin, and appearing under the lens to be slightly interrupted about the middle; it also is irregular in outline, and margined behind with a transverse tuft near the costa, and has some scattered silvery scales margining it behind from the middle to the dorsal margin, and extending back along the

margin. Just before the costal fringes is a large silvery spot which extends nearly to the dorsal margin, and almost unites with the silvery scales by which that margin is marked behind the second fascia. *In* the second fascia, *on* the extreme costa are two minute white spots, and *on* the extreme costa in the large silvery spot before the cilia are two others and behind them yet two others more distinct; these last four spots are nearly equi-distant, and opposite to them, are three others at the base of the dorsal cilia. Tip of the forewings yellowish-white with some black scales in the middle of the yellowish part, and external to it is a narrow blackish hinder margined line at the base of the apical cilia. Cilia showy white. Hind wings and upper surface of the abdomen silvery tinged with golden. Under surface of the primaries brown, tinged with purple, that of the hind wings a little paler. First and second pair of legs mainly white, the third pair mostly blackish, but all annulate with white; Venter with the basal half of each segment brown, apical half yellowish white. *Al. ex.* a little over $\frac{1}{2}$ inch. Kentucky, in June. The tufts on the wings are very easily rubbed off.

The next following fourteen species are from California:

ENDROSIS—*E. ferrestrella.*

Dr. Clemens has described a species of this genus as *E. Kennicottella,* which Mr. Stainton thinks, will prove to be the well known European *E. fenestrella.* I have not seen Dr. Clemens specimens, nor have I found any species of *Endrosis* in this country. I have, however, received from Mr. Behrens, from San Francisco, specimens, which, in my judgment, are unquestionably *E. fenestrella;* and, from the relative proportions of the few species sent to me by Mr. Behrens, is by far the most abundant 'micro' in that region, as abundant, in fact, as all other species together. The specimens differ greatly, and on comparing them with Dr. Clemens description of *E. Kennicottella,* I concur entirely with Mr. Stainton that it must be *fenestrella.*

GELECHIA—*G. lacteus-ochrella,* n. sp.

Creamy white, or, perhaps, better described as white very faintly suffused with ocherous, sparsely flecked with brown upon the forewings, which become towards the tip, suffused with grayish, or purplish-brown and ocherous, so that a white costal streak at the begining of the cilia may be distinguished from the surrounding part of the wing. The cilia are yet more deeply suffused with purple-brown and ocherous-

yellow. There is a minute brown spot on the disc before the middle, another about the middle, and one about the end of the cell. *Al. ex.* not quite $\frac{1}{2}$ inch. California, received from Mr. Behrens.

GELECHIA—*G. maculatuscella*, n. sp.

Face white; a bunch of yellow scales or bristles on each side below the eyes. Anterior margin of the thorax black, the central portion blackish but deeply suffused with red, with the tip and each side above the base of the wings. Primaries ashen white sprinkled with numerous small dark brown dots, a row of which extends along the entire costal margin which is also tinged with roseate; the wing beneath the fold to the dorsal margin is also somewhat tinged with roseate, with a few small brown spots. In some lights a large part of the wing appears strongly tinged with roseate. *Al. ex.* $\frac{3}{8}$ inch. Received from Mr. Behrens.

G. thoracestrigella, n. sp.

Palpi ocherous with the outer surface of the second joint brownish, except at the tip and about the middle, and brown annulation at the base of the third and another before the tip. Head, thorax and primaries ocherous, dusted with brown; the brown scales on the top of the thorax are aggregated into three not very distinct longitudinal streaks, the dusting is dense at the base of the costa and at the base of the wing, it is aggregated into three indistinct spots, behind which are three others, and behind these, two or three others; these spots form three oblique rows, and behind them the dusting increases in quantity to the apex. *Al. ex.* $\frac{9}{16}$ inch. Behrens, California. It is somewhat difficult to distinguish it from our *G. fuscopulvella*, ante v. 4 p. 170, but careful examination satisfies me that they are distinct. The palpi in *fuscopulvella* are much darker, a portion of the dusting on the thorax is condensed into a transverse band instead of three longitudinal streaks, and the obliquely placed spots not very distinct in this species are wanting in *fuscopulvella*. However in *fuscopulvella*, the spots on the margin of the wing are sometimes confluent, and indeed there is nothing in the ornamentation of the wings, which would induce me to consider them as distinct species, but the second joint of the palpi is larger and more brush like in *fuscopulrella*, and this, and the makings of the thorax above mentioned, sufficiently characterize them as distinct species.

G. æquepulvella—Cham.

I have also received from Mr. Behrens, specimens of this species, I have also received it from Mr. Belfrage, of Waco, Texas, and have taken it frequently in Kentucky, as elsewhere stated.

G. thoracenigræella, n. sp.

Second joint of the palpi scarcely brush-like and divided beneath. Palpi dark brown except the basal portion of the inner margin, and two annulations on the third, which are ocherous; lower face ocherous mixed with fuscus; head, thorax and base of wings dark brown. Primaries pale ocherous gray with a row of about ten brown spots on the costa, which increase gradually in size from the base towards the apex, and a distinct brown spot or streak on the disc before the middle, behind which the disc is suffused with fuscus, the suffused part being connected with one or more of the costal spots. *Al. ex.*, $\frac{9}{16}$ths inch. Behrens, California. In the dark brown thorax it resembles *G fuscomaculella*, Chamb.

G. thoracefasciella, n. sp.

Second joint of the palpi brush-like. Palpi dark brown, except the upper surface of the second joint, which is white; head, thorax and wings brown, with a blueish smokey tinge; anterior tarsi annulate with white, intermediate and posterior tarsi reddish-yellow; under surface of the abdomen yellowish, densely dusted with dark-brown; lower part of the face white, and then is a yellowish-white band across the thorax just before the tip, and the thorax and wings are microscopically flecked with white. The primaries have two oblique velvety black short streaks on the disc, each, of which, is margined before and behind with ocherous-yellow, and at the end of the discal cell is a small ocherous spot, margined narrowly behind with a line of velvety-black scales, there is, also, a minute ocherous-yellow spot just before the costal cilia, and another opposite dorsal one, and a row of small velvety-black spots around the apex at the base of the cilia, the one at the apex being margined before with ocherous-yellow. These black and ocherous spots are all small and somewhat indistinct. *Al. ex.*, $\frac{1}{2}$ inch. Behrens, California.

G. occidentella, n. sp.

Palpi with a large brush on second joint, which is brown, tipped at the apex with ocherous-yellow, and the third joint dusted with scales of the same hue. Head and face pale yellow, silver tinged; tongue

dark brown; thorax rusty-ocherous, or ocherous-yellow, mixed, more or less, with dark brown, and the tip dark brown. There is a good deal of variation as to the amount and intensity, as well as disposition, of the dark brown and ocherous scales, both on the thorax and on the wings. The primaries are clothed with brown and ocherous, in about equal proportions. The costal basal portion is ocherous, passing into grayish-ocherous and brown on the dorsal margin, the extreme base of the costa is dark brown, the costal part of the middle of the wing is dark brown, while, on the dorsal margin, it is pale brown, and in this brown portion on the disc before the middle, are two small oblique velvety-brown streaks; just before the cilia is a curved ocherous fascia, concave towards the base, distinct on both margins, but indistinct in the middle from the intermixture of brown scales; the apex, behind the fascia, is brown; the cilia are grayish-ocherous, dusted with brown; a row of small dark brown spots around the apex at the base of the cilia, each margined before with ocherous-yellow. *Al. ex.*, $\frac{5}{8}$ths inch. Behrens, California.

G. grisseochrella, n. sp.

Second joint of the palpi somewhat brush-like, pale grayish-ocherous, or, rather, of a pale ocherous-yellow, tinged with gray; there is a dark brown streak perpendicular to the base of the dorsal margin, a small dark brown spot just above the fold (sometimes touching it), before the middle; following is an oblong oblique dark brown spot on the fold, very narrowly margined above with whiteish scales; there is a row of small dark brown spots along the costa, one at the end of the cell, and a row of them around the apex at the base of the cilia. The under surface of the body is sprinkled with brown, and the legs, on their anterior surfaces, are, in parts, sprinkled, and in others strongly suffused with brown. The antennæ are brown; the wings are wide, the posterior the widest, and the neuration is nearly that of *Œcophora* (*Callima, argenticinctella*, Clem. *Al. ex.*, $\frac{5}{8}$ths inch. Behrens, California.

G. ochreostrigella, n. sp.

Second joint of the palpi somewhat brush-like. Third joint slender and little more than half as long as the second. Third joint of the palpi dark brown; second joint, tongue, face vertex, a band from the head to the apex of the thorax and the forewings beneath the fold pale ocherous-yellow; the sides of the thorax are dark purple brown, and

the basal portion of the forewings above the fold and extending along the costal margin as far as the middle are dark brown with a faint purple tint. All the veins and veinlets of the wing are dark brown, while the cell (which is very narrow) and the spaces between the marginal vienlets, and between the median and sub-median veins are pale ocherous-yellow. The pale ocherous-yellow of the cell and of the space between the median and submedian veins extends nearly to the base; towards the dorsal margin the course of the fold is also faintly marked with brown, the apex is brown, the ocherous-yellow spaces the veinlets, being clouded with brown in that part of the wing. When the insect is at rest it appears to be dark brown with a pale yellowish line beginning on the palpi and extending back over the tongue, head, thorax and dorsal margin of the wings to the cilia with the apical half or more of the wing except at the apex streaked alternately with dark brown and pale yellowish. The first two pairs of legs are dark brown on their anterior surfaces marked with the pale ocherous hue at the joints; the posterior pair is pale ocherous and the abdomen is pale ocherous with the basal half of each segment more or less densely dusted with dark brown. *Al. ex.* $\frac{5}{8}$ inch. Behrens, California.

G. discostrigella, n. sp.

The palpi are missing in the single specimen of this species which I have received from M. Behrens, of San Francisco. The head is creamy white with a large bronzed or purple brown spot on the vertex extending down between the eyes; the basal joint of the antennæ is purple brown tipped with creamy white, the stalk creamy white annulate with purple brown. The thorax is purplish brown margined before the apex on each side with creamy white, base of the wings purplish-brown beyond which to the middle they are creamy white, that color extending along the dorsal margin to a point beyond the middle but scarcely to the middle on the costal margin; on the dorsal margin about the middle and in the creamy white portion is an ocherous spot, and along the costal margin are two or three small brownish spots also in the creamy white part of the wing, which along the costal margin about the middle passes gradually into ocherous-yellow, as it also does on the dorsal margin beyond the middle. This ocherous hue overspreads the whole apical half of the wing. On the disc, before the middle, margining the creamy white anterior part of the wing, is an oblique black transverse spot which is narrowly separated by ocherous-yellow scales from a large somewhat diffuse brownish patch which covers the end of the cell and fades out gradually into the ocherous hue of that

part of the wing. The extreme costa is marked throughout its length by small purple brown spots, which also extend around the apex at the base of the cilia which are greyish ocherous; under surface and sides of the thorax creamy white flecked with brownish scales; legs purplish-brown mixed with creamy yellow, venter creamy yellow with a dark brown spot on each side of each segment. *Al. ex.* $\frac{5}{8}$ inch. A rather handsome insect received from Mr. Behrens.

G. ocherfuscella, n. sp.

The palpi are also wanting in the single specimen of this species received from Mr. Behrens. The insect is brownish-ocherous, the head being a little paler than the thorax and wings, which, in some lights, are rusty or reddish-ocherous rather than brown; the disc just before the middle, and the costal margin about the middle are distinctly suffused with fuscus, and that is the prevailing hue of the special part of the wing; the cilia are ocherous, with a dark brown hinder marginal line at their base, and two similiar, but not distinct, lines about their middle, perhaps, instead of these two last named lines, it would be as accurate to say that the cilia are sprinkled with brown scales, showing a tendency to arrangement in two concentric lines; the antennæ are brown, very indistinctly annulate with white; the anterior and middle legs are dark brown, somewhat dusted with ocherous, and with the tarsi annulate with that hue, the posterior legs are ocherous, dusted with brown, and so is the entire under surface of the insect. *Al. ex.*, $\frac{1}{2}$ inch.

Tinea—*T. Behrensella*, n. sp.

Palpi yellowish; hairs of the face and vertex yellowish, mixed with some of a darker hue; antennæ fuscus silvery tinged; primaries brownish, suffused with pale purple, and paler towards the dorsal margin, a reddish or purplish-brown line extends along the costal margin to about the middle, when it leaves the margin, passing backwards to the end of the disc, becoming, also, wider; apical part of the wing pale purple, or purplish-slate color with white scales intermixed; cilia pale straw color; under surface and legs whitish, except the anterior surfaces of the first and second pair of legs, which are brown, annulate with yellowish-white at the joints. *Al. ex.*, $\frac{3}{4}$ths inch. Named for Mr. J. Behrens, of San Francisco, from whom I received it.

T. niveocapitella, n. sp.

Dark brown; there is a small pale ocherous or whitish spot just within the dorsal margin, placed about midway of the wing length, and

margined before by black scales; head very pale yellowish-white; maxillary palpi fuscus, labial palpi dark brown, the third joint tipped with pale yellowish or white. *Al. ex.*, 7 lines. Behrens, San Francisco.

T. crocicapitella, Clem., resembles this species, but is more robust, and has the ocherous spot on the disc, and more distinct than it is in this species, and the head is not white, besides other differences.

GELECHIA—*G. saphirinella*, n. sp.

Forewings very slender, hind wings wider, and excised beneath the tip; second joint of the palpi a little thickened with scales beneath, and a little longer than the slender third joint; palpi white, with brown marks on the outer side of the second joint, and two annuli on the third joint, one near the base, the others near the tip; head white, streaked almost crimson-red, iridescent; antennæ brown; thorax and forewings with longitudinal streaks of almost sapphire-red, intermixed with brown, gray-brown, and ocherous streaks and spots. Beneath the fold before the middle is a small brown spot, and behind it, on the fold, is a brownish streak. The streaks and spots are inextricably mixed all over the wings, but under a good Codington lens they appear more distinct, and the bright red is more conspicuous. It is a slender, handsome and graceful-looking insect. *Al. ex.*, $\frac{3}{8}$ths inch.

G. nigrella, n. sp.

Second joint of the palpi a little thicker and shorter than the acicular third joint; very dark, shining brown or black; head of an ashy-purple hue, iridescent; second joint of the palpi yellowish-white, except the basal portion of the outer surface, which is brown; the third joint becomes fuscus towards the tip; antennæ pale brown; under surface of the body and the legs yellowish, stained with fuscus. *Al. ex.*, $\frac{1}{2}$ inch.

G. trialbamaculella, n. sp.

Second joint of the palpi brush-like white; third joint shorter than the second dark brown; face white; antennæ brown; forewings dark brown but much lighter than in *G. nigrella*, which it resembles in size, and also in ornamentation when viewed by the naked eye. There is a small white spot on the fold before the middle, a costal and opposite

dorsal one before the cilia, and under a good lens a few white dots are seen scattered over the wing, one of which is at the apex. Under surface of the body brown, as also are the legs, the joints of which are white. *Al. ex.* $\frac{1}{2}$ inch.

G. confusella, n. sp.

Second joint of the palpi brush-like, much longer than the third which is slender. Dark brown of nearly the same hue with *G. trialbamaculella.* Palpi sparsely dusted with white. There is a small white spot on the fold of the forewing about the middle, another opposite to it on the disc—and behind the space between these two is another minute yellowish white spot. The usual opposite costal and dorsal spots at the beginning of the cilia are present but small. It resembles *G. trialbamaculella*, but is easily distinguished therefrom not only by its larger size and the different arrangement of the spots (which in both are scarce visible without a lens), but also by the form and size of the palpi, *Al. ex.* $\frac{5}{8}$th inch.

G. latifasciella, n. sp.

Palpi simple, second joint whitish above, dark gray brown beneath, third joint dark gray brown, with its base tip and a narrow annulus before the middle white; head and anterior margin of the thorax white with a faint purplish tinge; antennæ brown annulate with white; thorax and base of the primaries dark brown, and a tuft of raised scales on each side of the thorax before the tip; just before the middle of the wing is a broad white fascia widest on the dorsal margin, and margined in front by two small raised tufts of white scales, one of which is above, and another beneath the fold; behind the fascia is a transverse row of dark brown raised scales, behind which the wing is dark brown to the cilia, where it becomes gray from the large intermixture of white scales, and there is a small irregular patch of dark brown scales at the apex; nearly opposite the begining of the cilia are two raised tufts of dark brown raised scales, and just behind them is an indistinct narrow curved gray fascia. Under the lens the apical part of the wing has a white grained color, dusted densely and as it were, overlaid by dark brown, and some white scales may be discovered as far forward as the white fascia. Under surface of the thorax white; legs white banded and spotted with dark blueish brown; abdomen yellowish white beneath with a subdued silvery luster with a dark brown spot on each side of the first segment. *Al. ex.*, $\frac{5}{8}$th inch.

I have described the most distinctly marked of these specimens, received from St. Louis, Mo., from Miss Murtfeldt, and a single specimen in Mr. Belfrazes collection from Texas. In each of the others the fascia is so densely dusted with dark brown, as to appear gray to the naked eye, the apical part of the wing is also darker gray, the tufts on the anterior margin of the fascia are largely mixed with brown, and the specimens are smaller. But I have no doubt that they belong to the same species. They were bred by Miss Murtfeldt from larvæ rolling oak leaves.

G. trifasciella, n. sp.

Second joint of the palpi brush-like; palpi, head and a wide band extending to the tip of the thorax, white, sometimes tinged with ocherous; sides of the thorax, patagia and forewings dark brown; on the forewings are three distinct oblique white fascia, one about the basal fourth, one about the middle, and one just before the cilia, the first and third being frequently obsolete or interrupted in the middle. It differs from *G. thoraccalbella* only by the presence of these fasciæ.

G. capiteochrella, n. sp.

Second joint of the palpi brush-like, third shorter than the second; head and palpi pale ocherous, the base of the second joint of the palpi and tip of the third joint dark; thorax and forewings dark brown, with the extreme tip of the thorax, and a few minute spots on the forewings, ocherous; one of these spots is on the fold towards the base, three or four others at about the middle of the wing, and there are two other minute ones in the apical part of the wing; the venter is ochreous; legs dark brown, and tarsi annulate with ochreous. *Al. ex.*, $\frac{3}{8}$d inch.

Sometimes, the usual costal and dorsal spots before the cilia are distinct, and sometimes absent, when present, they are pale ocherous.

G. palpilineella, n. sp.

To the naked eye, this species resembles *G. nigrella*, being dark brown, almost black, and of the same size. Under the lens, however, a distinct irregular white fascia appears at the beginning of the cilia, but, which, is sometimes interrupted in the middle; the third joint of the palpi is whitish, with three narrow black lines, extending from

its base to its apex, reminding one of the similar ornamentation in the species of the genus *Hapsa*. It resembles *G. albistrigella*, Cham., perhaps, as closely as *G. nigrella*

G. milleriella, n. sp.

Palpi simple. Ground color very pale grayish-ocherous, almost white, marked with obscure pale yellow spots on the wings, which are, also, dusted with brown, and marked with minute brown spots; one of these spots is on the extreme costa at the base, and just behind it is another, which is in an oblique line with two others, the last, of which, is on the fold; behind this is another small one, also, on the fold, opposite, to which, on the costa, is another; there is a large brown costal spot on the costa, just before the cilia, and a small one opposite to it on the dorsal margin, and between these two, are two somewhat diffuse spots; there is a row of dark brown spots around the base of the cilia; the antennæ are yellowish, except the apical half of the basal joint, which is dark brown; the first and the base of the second joints of the palpi are dark brown, the palpi being, otherwise, of the general hue, dusted with dark brown. *Al. ex.*, $\frac{7}{16}$ths inch.

G. grissefasciella, n. sp.

Palpi simple. Insect ash-gray. There is a small oblique black streak on the forewings about the middle of the costal margin, and a pale gray or whitish fascia at the beginning of the costal cilia, a little nearer to the apex on the costal than on the dorsal margin, which reminds one, somewhat, of the fascia of *G. tephriasella*, Cham. *Al. ex.*, $\frac{7}{16}$ths inch.

G. palpialbella, n. sp.

Palpi long, slender and simple; second and third joints about equal in length, the third acuminate; palpi whiteish, except the basal joint and the base of the second joint on its outer surface; head, thorax and forewings dark grayish-brown, with obscure small spots of dark velvety-brown on the wings. Seen by the naked eye it might be mistaken for *G. physaliella*, Cham. *Al. ex.*, $\frac{7}{16}$ths inch.

G. concinnusella, n. sp.

Palpi simple, antennæ very slender, insect ash gray with three or four minute brown spots on the disc. There are two narrow, very

oblique, short, dark brown, costal streaks near each other, one just before and the other just behind the middle, followed immediately by a narrow white costal streak which passes obliquely back into the middle of the apical part of the wing where it meets and forms an acute angle with an opposite dorsal streak, and behind this acute angle the apex is hoary with anapical black spot or dash. At the base of the cilia there is a narrow dark brown hinder marginal line which is margined behind by a row of hoary scales. The costal and dorsal margins, at the base of the cilia, are suffused with pale ocherous. *Al. ex.* $\frac{3}{16}$ inch.

G. discoanulella, n. sp.

Palpi simple slender, third joint as long as the second, pale yellow. Basal half of the antennæ thick, apical half narrowing rapidly to the apex, the basal half with large joints, those of the apical half short and closely set. Insect, pale ocherous; head tinged with fuscus; thorax and forewings very pale ocherous, so densely dusted with grayish fuscus as almost entirely to conceal the ground color; the fold is ocherous yellow with two or three brown spots on it; there are two or three small brown spots on the disc, and a row of them around the apex. At the end of the discal cell is a pale ocherous annulus with a central dark brown spot like that of *G. discoocelella*, Cham., from which however the species is otherwise very distinct.

G. obscuroocelella, n. sp.

Second joint of the palpi somewhat brush-like, much longer than the third. Pale or whitish gray; basal joint of the palpi and base of the second joint, on the outer surface, brown, base of the extreme costa dark brown. There are three obscure brownish ocherous spots on the forewing, one of which is on the disc, another near it on the fold, and the third at the end of the cell, this last having an indistinct annulus around it. *Al. ex.* 11-16 inch.

G. subruberella—(Cham.)

In some old and somewhat worn specimens the surface markings almost, or even, entirely disappear.

G. crescentifasciella—(Cham.)

I am afraid this specific name may be misleading, as the fascia is always indistinct, and in some specimens I have not been able to detect it.

G. ocherosuffusella—(Cham.)

Possibly *G. depussostrigella* may be the same species, I correct the former description by stating that the second joint of the palpi is dusted with white instead of yellow, and the third joint is yellowish dusted with brown.

ŒSEIS—*Gen. nov.*

Palpi long recurved the second joint with a long tuft projecting downwards, but not forward beyond the apex; the tuft has almost exactly the outline of an equilateral triangle, the base of which on the joint is perhaps a little shorter than either of the other two sides, one of which is perpendicular from the apex of the second joint. Antennæ simple about as long as the body with the basal joint a little elongate, third joint of the palpi as long as the second; vertex as wide as long face wider than its length. Maxillary palpi small (about as in *Gelechia*); tongue long, scaled.

The wings are those of *Gelechia* (some species), from which perhaps this genius should not be separated. The hind wings very faintly emarginate beneath the apex.

Œ. bianulella, n. sp.

Palpi with the tuft blackish at the base of the joint, and along the under edge of the tuft, otherwise white suffused with grayish, on its anterior edge and with a blackish spot at the apex at the tuft; third joint white a little dusted with brown, and with the apex brown; antennæ redish brown; head and thorax white tinged with ocherous and dusted with brown, and somewhat iridescent, and there is a narrow dark brown line just above the base of the wings. Forewings ocherous and dark brown streaked with white, with the base of the dorsal margin rufous, the basal portion of the costal margin white, tinged with ocherous. The colors on the wing are so intermixed as to make an intelligible description, almost impossible. The scales cov-

ering the discal cell are dark brown, with a white annulus before the middle of the wing, and a white spot or ring at the end of the cell; the wing in other portions is marked with alternate streaks of whitish, and brown many of the white streaks especially in the dorsal portion, being strongly tinged with ocherous, and the streaks are very indistinct. Perhaps it would more accurately describe the wing other than the base, and the cell as being ocherous gray, a little sprinkled with white, with the position of the veins marked by dark brown lines. Ciliæ ocherous gray. *Al. ex.*, $\frac{3}{4}$ inch.

HOLCOCERA—*H. triangularisella, n. sp.*

Palpi grayish fuscus the end of the second joint hoary or white; face whitish; head, antennæ, thorax and base of the forewings grayish fuscus; then follows on the forewings a whitish triangular fascia, wide on the dorsal margin, but narrowing almost to a point on the costal margin, and densely dusted with brown, and it is widely margined behind by a dark brown costal spot, which extends nearly to the fold and sometimes is almost triangular in form. Thence to the apex the wing is whitish, densely dusted with brown and has two minute end of the cell, under surface of body and the legs densely dusted with fuscus, the legs annulate with white, *Al. ex.*, $\frac{11}{16}$ inch.

All of the species of this genus that I have seen are very variable and although with two specimens of this species before me, five of *H. clemensella*, six of *H. glandulella*, and one of *H. chalcofrontella* (the variation of which was noticed by Dr. Clemens), the species seem to be distinct, yet I can not avoid a suspicion that when the species are better understood in all these stages, and large numbers are available, the number of species in the genera will have to be greatly reduced. It will not surprise me if two or three of Dr. Clemens' species will include all the supposed species of that author, as well as *H. glandulella*, Riley, and those described by me.

Amadrya and Euplocamus.

Dr. Clemens suggested the resemblance of *A. effrenatella*, Clem., to *Euplocamus boleti*, and Mr. Stainton in his edition of Dr. Clemens' papers suggests that *A. effrenatella* (of which he had seen a specimen) belongs in *Euplocamus*. But Mr. Stainton in *Ins. Beit v.* 3, states that the palpi of *Euplocamus* are six jointed, and Dr. Clemens says they are small and two jointed in Amadrya, and in a single specimen of an

insect which I have taken in Kentucky and believe to be *A. effrenatella*, the maxilary palpi are microscopic and so concealed that I can not determine the number of joints. *Euplocamus* also, according to Mr. Stainton, has a short tongue; but Dr. Clemens says that *Amadrya effrenatella* has no tongue; and I have not been able to detect a tongue in the specimen above referred to. In the specimen from Texas, described by me as *Amadrya clemensella*, there certainly is no trace of either tongue or maxillary palpi; but I can not perceive that it differs otherwise from *Amadrya*, as defined by Clemens, or from my supposed *Amadrya effrenatella*. In the species, described below, as *Euplocamus fuscofasciella*, of which I possess a single specimen in good condition, *I think* I can detect a trace of a tongue concealed beneath the *four jointed* maxillary palpi. (If it has six joints the two basal ones must be very small and concealed beneath the long scales of the face.) In *A. clemensella* the spots on the wings, in fresh specimens, are quite distinct but vary in form and position. Sometimes there is a long fuscus spot on the fold.

Euplocamus (?) fuscofasciella, n. sp.

The palpi are brown on the upper and external surfaces, and on the basal portion of the tuft beneath; on the inner surface they are yellow.

Head sordid yellowish; antennæ brown; thorax and patagia brown at base, but becoming yellowish towards the tip. To the naked eye the forewings appear yellowish, mottled with brown with some distinct brown spots, and a rather wide irregular brown fascia behind the middle, the anterior margin of which is straight from the costa to the fold, but having the posterior margin angulated backwards about the middle of the wing, at the fold the fascia is narrowed suddenly behind; the basal portion of the wing is distinctly brown, and there are two distinct brown spots in the apical part of the wing. Under the lens the entire wing appears to be traversed transversely by numerous narrow intercepted, confluent, and irregular brown lines on a yellow ground, the brown of the fascia and base of the wing almost entirely obscuring the yellow. Abdomen brownish above, yellowish beneath. Anterior and middle legs yellowish stained with fuscus with the tarsi fuscus annulate with yellowish; hind legs yellowish with some brownish markings on the anterior surface, especially on the tarsi. *Al. ex.* 1⅛ inch.

Tinea—*T. apicimaculella, n. sp.*

Antennæ and outer surface of the palpi brown, inner surface of the palpi and the apex yellow; head sordid yellowish; thorax and fore-

wings above the fold yellowish, suffused and dusted with fuscus so as to obscure the ground color; there is a large brown spot about the middle of the wing, and one at the end of the disc, and behind it the apical part of the wing, is marked with more or less obliquely transverse rows of small dark brown spots; beneath the fold the wing is but little suffused with fuscus. *Al. ex.*, $\frac{1}{2}$ inch.

T. unomaculella, n. sp.

Thorax and forewings dark brown with a yellowish spot at the end of the cell; antennæ and outer surface of the labial palpi brown, inner surface and apex yellowish; head and maxillary palpi yellowish, under surface and legs yellowish marked with fuscus. *Al. ex.*, $\frac{3}{8}$ inch.

Besides the species already mentioned found in these collections, which have been heretofore described from more Northern States, are some damaged specimens of a *Tischeria* (*T. badiiella*, Cham)? and *Tinea Maculabella*, Cham. In the latter species "the oblique irregular streak before the middle" does not quite reach the fold, and the spot towards which it points is on the fold; the "longitudinal streaks" in the apical part of the wing sometimes become more or less rounded or irregular spots. In specimens slightly denuded the costal streaks become disconnected spots.

The foregoing descriptions of "Teneina from Texas" are the conclusion of a series, the remainder of which have been heretofore published in the Canadian Entomologist. Since they were prepared I learn from Dr. Parkards' "Record of American Entomology" that Prof. Zeller has described (*Abhaud, K. K. Zoo. Bot. Ges. Wein*, 1873), many species of North American Teneina, mostly collected in Texas, by Messers Belfrage and Ball, and much the greater number of which belonging to the *Gelechidæ*. No doubt some of the species, especially of the *Gelechidæ* described by me in the "Tineina from Texas," will prove to have been previously described by Prof. Zeller, in the paper above referred to; while on the other hand, some of the species then described will prove to be identical with species previously described by me from Kentucky, and other more Northern States, in the Canadian Entomologist.

To Dr. Hagen I am indebted for another paper by Prof. Zeller (Beitrage zur Kenntners der Nordamerikanischen Nachtfaller &c., 1872), in which I find *Anesychia Multipunctella*, Cham., previously described by Prof. Zeller, as *Psecadia semilugens*, with a figure of the wings. I have no access to Hübners diagnosis of *Psecadia*. Stephens (Haust v. 4, p. 241), divides *Anesychia* into two sections, viz: "A

Anterior wings with confluent black spots, forming a longitudinal streak from the base nearly or entirely to the apex; *Anesychia* Hübner"—"B. Anterior wings with distinct black spots and blotches of variable size: *Psecadia* Hübner." *Semiugens* does not strictly belong in either section but the ornamentation is nearer to that of section A.

Review of the Glacial Theory, by S. A. Miller.

[Read before the Cincinnati Society of Natural History, May 4th, 1875].

Mr. President—It is doubtless known, to the most of you, at least, that Professor Newberry has been for several years an advocate of certain views, which he and those who profess to believe with him call the "Glacial Theory." He has discussed this theory over 200 or 300 pages of the Ohio Geological Survey, and finally laid down, in an essay of about 80 pages, in the second volume of the Geology, his "best impressions" upon the subject. It is not too much to say, that he has presented the theory, in as favorable a light, as it has been presented by any other advocate, and if it is geology, no apology is necessary for the space occupied in its consideration.

I am not convinced, however, that there is any geology in his views, or anything worthy to be called a geological theory. On the contrary, they seem to me to be a collection of wild absurdities, promiscuously thrown together. While having the highest regard for the scholarly attainments and great geological information of Professor Newberry upon matters in general, I am, nevertheless, disposed to criticise his glacial theory, and to treat it lightly. It is proper to criticise the theory of any man, even to ridicule it, because by testing it we learn its strength. Facts in matters of science will take care of themselves.

He says that the Continent, since it had its present outlines and ranges of mountains, and since the close of the Tertiary period, must have stood several hundred feet higher than it does now. Where is the evidence of such elevation, pray? He says it is proved by the great system of buried river channels. And where is that system? Echo will answer, where? He says it is proved "by the deeply excavated troughs of the Hudson, Mississippi, Columbia, the Golden Gate, &c., which could never have been cut by the streams that now occupy them, unless when flowing with greater rapidity and at a lower level than they now do." But every physicist knows, that the chan-